CATALOGUE AND PRICE LIST

WINTER BROS. COMPANY

WRENTHAM, MASS., U. S. A.

MAKERS OF

TAPS, DIES AND DIE STOCKS

THISTLE BRAND

CATALOGUE No. 5.

THIS CATALOGUE CANCELS ALL
PREVIOUS EDITIONS

IMPORTANT

READ PAGES
No. 4, 5, 6 and 31

CATALOGUE No. 5

Read carefully all notes referring to lists.

Read pages 4, 5, 6 and 31.

All goods listed in this catalogue are fully warranted, and we will replace any tool showing imperfections in material or workmanship.

When specifications differ in any way from our lists, the goods referred to will be classed as special, and will be charged at special prices.

When ordering, or making inquiry for special tools, give complete specifications, submitting a sketch or sample when possible. We cannot be held responsible for errors when full instructions are not furnished.

When ordering taps or dies to fit a sample, always send a male gauge if possible.

When shipping instructions are not given, we will ship according to our judgment, and will make no allowance for the difference between freight and express charges.

All shipments are made F. O. B. Wrentham, Mass.

All goods sent by mail will be at the purchaser's risk.

We ship no goods C. O. D.

IMPORTANT INFORMATION.

There is no recognized standard for the size of V thread taps. The theoretically perfect V thread, (see page No. 5) cannot be produced. Each tap manufacturer has adopted standards of his own, all differing somewhat from other standards, but all made a little over standard size in their outside diameters, and having their angle or pitch diameters increased a little more than their outside diameters, in order that the threads shall not be impractically sharp. It is therefore evident that the outside diameter alone is far from being a perfect index of the size of a V thread tap, and the pitch diameter should also be specified when ordering.

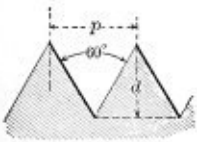
To avoid all trouble in this matter we advise the use of the U. S. S. formula (see page No. 6) for all regular threaded work.

We expect shortly to eliminate all V thread taps and dies from our regular lists. In anticipation of this radical change we are now prepared to furnish, at regular prices, taps with U. S. form threads in pitches finer than the standard, (see page No. 31).

It is not possible to make or temper taps or dies so that they can be used to the best advantage, in one form or temper, on all classes of work. The material operated upon, the method of operation, speed, lubrication, etc., all enter into the problem. Take this matter up with us if you have troubles in this line. We have had a great deal of experience with special work.

A. L. A. M. STANDARD. We furnish, at regular prices, hand, nut, tapper and Beaman & Smith taps, and round dies, conforming to the standard adopted by the Association of Licensed Automobile Manufacturers, (see list of sizes, page No. 30.)

V STANDARD THREAD



Formula $\begin{cases} P = \text{pitch} = \dfrac{1}{\text{No. threads per inch.}} \\ D = \text{depth} = P \times .86603 \end{cases}$

Do not be deceived by the above formula. It is not possible to form, by ordinary means, 60 degree threads of the theoretical depth, and the nearest approach we can make to it produces threads so sharp as to be impracticable. On this account our standard V thread taps and dies are all made with their angular measurement, or pitch diameter, considerably larger than the theoretical size. All other tap makers follow the same principle, but no two make the same allowance on all sizes. Therefore: THERE IS NO RECOGNIZED STANDARD FOR V THREAD TAPS.

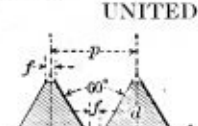
STANDARD PITCHES

Diameter.	1/4	5/16	3/8	7/16	1/2	9/16	5/8	11/16
No. Threads.	20	18	16	14	12	12	11	11
Diameter.	3/4	13/16	7/8	15/16	1	1 1/8	1 1/4	1 3/8
No. Threads.	10	10	9	9	8	7	7	6
Diameter.	1 1/2	1 5/8	1 3/4	1 7/8	2	2 1/8	2 1/4	2 3/8
No. Threads.	6	5	5	4 1/2	4 1/2	4 1/2	4 1/2	4 1/2
Diameter.	2 1/2	2 5/8	2 3/4	2 7/8	3	3 1/8	3 1/4	3 3/8
No. Threads.	4	4	4	4	3 1/2	3 1/2	3 1/2	3 1/4
Diameter.	3 1/2	3 5/8	3 3/4	3 7/8	4			
No. Threads.	3 1/4	3 1/4	3	3	3			

There are no standard pitches for diameters less than 1/4", but we specify in our lists the threads which continued use has caused to be recognized as such.

NOTE—We recommend the use of the U. S. S. form of thread only. In a short time we expect to eliminate all V thread taps and dies from our regular lists, (see pages 4, 6 and 31).

UNITED STATES STANDARD THREAD.



Formula

$$P = \text{pitch} = \frac{1}{\text{No. threads per inch.}}$$

$$D = \text{depth} = P \times .64952$$

$$F = \text{flat} = \frac{P}{8}$$

Unlike the sharp V thread, the U. S. S. form can readily be cut to the figures resulting from the use of the formula.

Taps are not generally made exactly standard size, but slightly larger, so that standard plug thread gauges will easily screw into the tapped holes, and also to allow a little for wear.

STANDARD PITCHES.

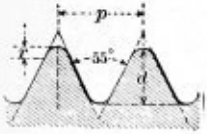
Diameter.	1/4	5/16	3/8	7/16	1/2	9/16	5/8
No. Threads.	20	18	16	14	13	12	11
Diameter.	3/4	7/8	1	1 1/8	1 1/4	1 3/8	1 1/2
No. Threads.	10	9	8	7	7	6	6
Diameter.	1 5/8	1 3/4	1 7/8	2	2 1/8	2 1/4	2 3/8
No. Threads.	5 1/2	5	5	4 1/2	4 1/2	4 1/2	4
Diameter.	2 1/2	2 5/8	2 3/4	2 7/8	3	3 1/8	3 1/4
No. Threads.	4	4	4	3 1/2	3 1/2	3 1/2	3 1/2
Diameter.	3 3/8	3 1/2	3 5/8	3 3/4	3 7/8	4	
No. Threads.	3 1/4	3 1/4	3 1/4	3	3	3	

The U. S. S. sizes include neither any sizes under 1/4" diameter, nor 11/16" 13/16" and 15/16"; but we list sizes 1/16" to 7/32" diameter with U. S. form threads; also 11/16–11, 13/16–10 and 15/16–9.

See also list of A. L. A. M. standard sizes, page No. 30.

We strongly recommend the use of U. S. S form threads, and expect shortly to drop all V threads from our regular lists. In anticipation of this we are now prepared to furnish U. S. form threads in pitches finer than the standard, (see list on page No. 31.)

WHITWORTH STANDARD THREAD.



Formula

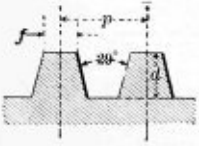
$$P = \text{pitch} = \frac{1}{\text{No. threads per inch.}}$$

$D = \text{depth} = P \times .64033$

$R = \text{radius} = P \times .1373$

Diameter	No. Threads per Inch.	Diameter	No. Threads per Inch	Diameter	No. Threads per Inch	Diameter	No. Threads per Inch
1/4	20	7/8	9	2	4 1/2	3 1/4	3 1/4
5/16	18	15/16	9	2 1/8	4 1/2	3 3/8	3 1/4
3/8	16	1	8	2 1/4	4	3 1/2	3 1/4
7/16	14	1 1/8	7	2 3/8	4	3 5/8	3 1/4
1/2	12	1 1/4	7	2 1/2	4	3 3/4	3
9/16	12	1 3/8	6	2 5/8	4	3 7/8	3
5/8	11	1 1/2	6	2 3/4	3 1/2	4	3
11/16	11	1 5/8	5	2 7/8	3 1/2		
3/4	10	1 3/4	5	3	3 1/2		
13/16	10	1 7/8	4 1/2	3 1/8	3 1/2		

ACME STANDARD SCREW THREAD.



Formula

$$P = \text{pitch} = \frac{1}{\text{No. threads per inch}}$$

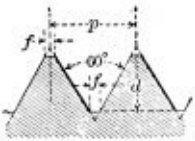
$D = \text{depth} = \frac{1}{2} \quad P \times .010''$

$F = \text{flat on top of thread} = P \times .3707$

It is the general practice to make the outside diameter of taps about .020" over the standard diameter of the screw, to cut a clearance above the screw threads.

INTERNATIONAL AND FRENCH STANDARD THREAD.

(METRIC SYSTEM)



Formula
$$\begin{cases} P = \text{pitch} \\ D = \text{depth} = P \times .6495 \\ F = \text{flat} = \dfrac{P}{8} \end{cases}$$

INTERNATIONAL STANDARD

Diameter Millimeters	Pitch Millimeters	Diameter Millimeters	Pitch Millimeters	Diameter Millimeters	Pitch Millimeters
6	1.0	20	2.5	48	5.0
7	1.0	22	2.5	52	5.0
8	1.25	24	3.0	56	5.5
9	1.25	27	3.0	60	5.5
10	1.5	30	3.5	64	6.0
11	1.5	33	3.5	68	6.0
12	1.75	36	4.0	72	6.5
14	2.0	39	4.0	76	6.5
16	2.0	42	4.5	80	7.0
18	2.5	45	4.5		

FRENCH STANDARD.

Diameter Millimeters	Pitch Millimeters	Diameter Millimeters	Pitch Millimeters	Diameter Millimeters	Pitch Millimeters
3	0.5	16	2.0	36	4.0
4	0.75	18	2.5	38	4.0
5	0.75	20	2.5	40	4.0
6	1.0	22	3.0	42	4.5
7	1.0	24	3.0	44	4.5
8	1.0	26	3.0	46	4.5
9	1.0	28	3.0	48	5.0
10	1.5	30	3.5	50	5.0
12	1.5	32	3.5		
14	2.0	34	3.5		

MACHINISTS' HAND TAPS.

TAPER

PLUG

BOTTOMING

All orders filled with V standard thread unless otherwise specified. See pages No. 4, 5 and 6.

All sizes and threads not listed are special and subject to special prices.

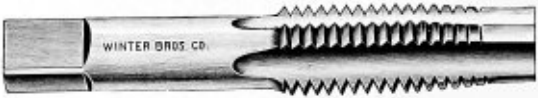
Hand taps with left hand threads are special.

Diameter	Standard Number of Threads		†V Threads also Furnished	Price	
	†V	U. S. S.		Each	Per Set
1/16	72	64	60, 64	$ .35	$1.05
5/64	72		56, 60, 64	.35	1.05
3/32	56	50	48, 50, 54, 60	.35	1.05
7/64	56		48	.35	1.05
1/8	40	40	32, 36, 48, 50	.35	1.05
9/64	40		32, 36	.35	1.05
5/32	32	36	30, 36, 40	.35	1.05
11/64	32		36	.35	1.05
3/16	24	*32	30, 32, 36	.35	1.05
13/64	24	*32	32	.35	1.05
7/32	24	28	32	.35	1.05
15/64	24		32	.35	1.05

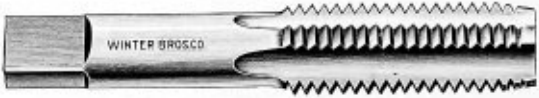
*We also regularly furnish $\frac{3}{16}$" and $\frac{13}{64}$" taps with 24 threads per inch, U. S. S. form.

†V thread taps will soon be classed as specials. See new list of taps with U. S. form threads, page No. 31, which we are now prepared to furnish at regular prices.

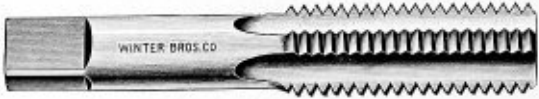
MACHINIST'S HAND TAPS.



TAPER



PLUG



BOTTOMING

When ordering state size; number of threads per inch; form of thread,—whether V, U. S. S. or Whitworth; and style,—whether taper, plug or bottoming.

All orders will be filled with plug taps with our standard V threads, unless otherwise specified; BUT NOTICE—V thread taps will soon be classed as specials. See new list of taps with U. S. form threads, which we are now prepared to furnish at regular prices; page 31. Also read pages No. 4, 5 and 6.

All orders for hand taps, up to and including $\frac{11}{32}$" diameter, will be filled with taps having shanks full size of thread. Taps $\frac{3}{8}$" diameter and larger will have shanks size of bottom of thread, unless otherwise ordered.

Hand taps with threads conforming to the standard of the Association of Licensed Automobile Manufacturers will be furnished at regular prices. See list of sizes, page No. 30.

All sizes, lengths and threads not listed are special, and subject to special prices.

All left hand taps are special.

MACHINISTS' HAND TAPS.

Diam.	Standard Number of Threads.			V Threads also furnished.	Price		Total Length, Inches.
	V	‡U.S.S.	Whit.		Each	Per Set	
3/16	24	*32	24	30, 32, 36	$0.35	$1.05	2 3/8
13/64	24	*32		32	.35	1.05	2 3/8
7/32	24	28	24	32	.35	1.05	2 3/8
1/4	20	20	20	24, 27, 32	.45	1.35	2 1/2
17/64	20	20		24, 27, 32	.45	1.35	2 1/2
9/32	20	20		24, 27, 32	.45	1.35	2 1/2
5/16	18	18	18	20, 24, 27, 32	.50	1.50	2 23/32
21/64	18	18		20, 24, 27, 32	.50	1.50	2 23/32
11/32	18	18		20, 24, 27, 32	.50	1.50	2 23/32
3/8	16	16	16	14, 18, 20, 24, 27	.55	1.65	2 15/16
25/64	16	16		14, 18, 20, 24, 27	.55	1.65	2 15/16
13/32	16	16		14, 18, 20, 24, 27	.55	1.65	2 15/16
7/16	14	14	14	12, 16, 20, 24, 27	.60	1.80	3 1/32
29/64	14	14		12, 16, 20, 24, 27	.60	1.80	3 1/32
15/32	14	14		12, 16, 20, 24, 27	.60	1.80	3 1/32
1/2	12	†13	12	13, 14, 16, 20, 24, 27	.70	2.10	3 3/8
33/64	12	†13		13, 14, 16, 20, 24, 27	.70	2.10	3 3/8
17/32	12	†13		13, 14, 16, 20, 24, 27	.70	2.10	3 3/8
9/16	12	12	12	14, 27	.80	2.40	3 13/32
37/64	12	12		14, 27	.80	2.40	3 13/32
19/32	12	12		14, 27	.80	2.40	3 13/32
5/8	11	11	11	10, 12, 20, 24, 27	.90	2.70	3 13/16
41/64	11	11		10, 12, 20, 24, 27	.90	2.70	3 13/16

*We also furnish 3/16" and 13/64" taps with 24 threads, U. S. S. form, at regular prices.

†Also furnished with 12 threads, U. S. S. form, when desired.

‡See page No. 31 for list of other threads, U. S. form, now furnished.

All left hand taps are special.

MACHINISTS' HAND TAPS.

(CONTINUED.)

Diam.	Standard Number of Threads			V Threads also furnished.	Price		Total Length, Inches.
	V	*U.S.S.	Whit.		Each	Per Set	
21/32	11	11		10, 12, 20, 24, 27	$0.90	$2.70	3 13/16
11/16	11	11	11	10, 12	1.05	3.15	4 3/32
23/32	11	11		10, 12	1.05	3.15	4 3/32
3/4	10	10	10	12, 20, 27	1.20	3.60	4 1/4
25/32	10	10		12, 20, 27	1.20	3.60	4 1/4
13/16	10	10	10	12	1.40	4.20	4 15/32
27/32	10	10		12	1.40	4.20	4 15/32
7/8	9	9	9	10, 12, 27	1.60	4.80	4 11/16
29/32	9	9		10, 12, 27	1.60	4.80	4 11/16
15/16	9	9	9	12	1.80	5.40	4 23/32
31/32	9	9		12	1.80	5.40	4 23/32
1	8	8	8	12, 27	2.00	6.00	5 1/8
1 1/32	8	8		12, 27	2.00	6.00	5 1/8
1 1/16	8	8		12	2.15	6.45	5 1/8
1 1/8	7	7	7	8, 12	2.25	6.75	5 7/16
1 3/32	7	7		8, 12	2.25	6.75	5 7/16
1 3/16	7	7			2.45	7.35	5 7/16
1 1/4	7	7	7	12	2.60	7.80	5 3/4
1 9/32	7	7		12	2.60	7.80	5 3/4
1 5/16	7	7			2.80	8.40	5 3/4
1 3/8	6	6	6		3.00	9.00	6 1/16
1 13/32	6	6			3.00	9.00	6 1/16
1 7/16	6	6			3.25	9.75	6 1/16
1 1/2	6	6	6		3.50	10.50	6 3/8
1 17/32	6	6			3.50	10.50	6 3/8

*See page No. 31 for other threads, U. S. form, now furnished.

All left hand taps are special.

MACHINISTS' HAND TAPS.

(CONCLUDED.)

Diam.	Standard Number of Threads.			Price		Total Length, Inches.
	V	U. S. S.	Whit.	Each	Per Set	
1 5/8	5	5 1/2	5	$4.20	$12.60	6 11/16
1 31/32	5	5 1/2		4.20	12.60	6 11/16
1 3/4	5	5	5	5.00	15.00	7
1 33/32	5	5		5.00	15.00	7
1 7/8	4 1/2	5	4 1/2	5.80	17.40	7 5/16
1 29/32	4 1/2	5		5.80	17.40	7 5/16
2	4 1/2	4 1/2	4 1/2	6.70	20.10	7 5/8
2 1/8	4 1/2	4 1/2	4 1/2	8.00	24.00	8
2 1/4	4 1/2	4 1/2	4	9.20	27.60	8 1/4
2 3/8	4 1/2	4	4	10.50	31.50	8 1/2
2 1/2	4	4	4	11.50	34.50	8 3/4
2 5/8	4	4	4	13.00	39.00	9
2 3/4	4	4	3 1/2	14.00	42.00	9 1/4
2 7/8	4	3 1/2	3 1/2	15.50	46.50	9 1/2
3	3 1/2	3 1/2	3 1/2	17.00	51.00	9 3/4
3 1/8	3 1/2	3 1/2	3 1/2	18.75	56.25	9 3/4
3 1/4	3 1/2	3 1/2	3 1/4	20.50	61.50	10
3 3/8	3 1/4	3 1/4	3 1/4	22.00	66.00	10
3 1/2	3 1/4	3 1/4	3 1/4	24.00	72.00	10 1/4
3 5/8	3 1/4	3 1/4	3 1/4	26.00	78.00	10 1/4
3 3/4	3	3	3	28.50	85.50	10 1/2
3 7/8	3	3	3	30.00	90.00	10 1/2
4	3	3	3	32.50	97.50	10 3/4

We also furnish taps from 2 to 4 inch inclusive 1/32 oversize, for rough iron, in V and U. S. S. form of thread, at regular prices.

All left hand thread taps special.

MACHINE OR NUT TAPS.

All orders will be filled with taps having our V standard thread, unless otherwise specified, but NOTICE—V thread taps will soon be classed as specials. We are now prepared to furnish, at regular prices, taps with U. S. form threads in pitches finer than the standard,—see list on page 31.

Nut taps with threads conforming to the standard adopted by the Association of Licensed Automobile Manufacturers are supplied at regular prices. See list of sizes and threads, page 30.

All sizes, lengths and threads not listed are special, and subject to special prices.

Nut taps with left hand threads are special.

MACHINE OR NUT TAPS.

Diam.	Standard Number of Threads.			V Threads also Furnished.	Price Each.	Total Length, Inches.	Length Thread, Inches.
	V	‡U.S.S.	Whit.				
1/16	24	*32	24	32	$ .60	4 1/2	1 5/16
13/64	24	*32		32	.60	4 1/2	1 5/16
7/32	24	28	24	32	.60	4 1/2	1 5/16
1/4	20	20	20	24	.60	5	1 5/8
17/64	20	20		24	.60	5	1 5/8
9/32	20	20		24	.60	5	1 5/8
5/16	18	18	18	16, 20, 24	.70	5 1/2	1 27/32
21/64	18	18		16, 20, 24	.70	5 1/2	1 27/32
11/32	18	18		16, 20, 24	.70	5 1/2	1 27/32
3/8	16	16	16	14, 18	.80	6	2 1/16
25/64	16	16		14, 18	.80	6	2 1/16
13/32	16	16		14, 18	.80	6	2 1/16
7/16	14	14	14	12, 16	.90	6 1/2	2 11/32
29/64	14	14		12, 16	.90	6 1/2	2 11/32
15/32	14	14		12, 16	.90	6 1/2	2 11/32
1/2	12	†13	12	13	1.00	7	2 23/32
33/64	12	†13		13	1.00	7	2 23/32
17/32	12	†13		13	1.00	7	2 23/32
9/16	12	12	12	14	1.15	7 1/2	2 23/32
37/64	12	12		14	1.15	7 1/2	2 23/32
19/32	12	12		14	1.15	7 1/2	2 23/32
5/8	11	11	11	10, 12	1.30	8	2 11/32
41/64	11	11		10, 12	1.30	8	2 11/32
21/32	11	11		10, 12	1.30	8	2 11/32

*Also furnished with 24 threads, U. S. form, when so ordered.
†Also furnished with 12 threads, U. S. form, when so ordered.
‡See page 31 for list of the other threads, U. S. form, now furnished.
All left hand thread taps are special.

MACHINE OR NUT TAPS.

(CONTINUED.)

Diam.	Standard Number of Threads.			V Threads Also Furnished	Price Each.	Total Length, Inches.	Length Thread, Inches.
	V	†U.S.S.	Whit.				
$\frac{11}{16}$	11	11	11	12	$1.45	$8\frac{1}{2}$	$2\frac{31}{32}$
$\frac{23}{32}$	11	11		12	1.45	$8\frac{1}{2}$	$2\frac{31}{32}$
$\frac{3}{4}$	10	10	10	12	1.60	9	$3\frac{1}{4}$
$\frac{25}{32}$	10	10		12	1.60	9	$3\frac{1}{4}$
$\frac{13}{16}$	10	10	10	12	1.80	$9\frac{1}{2}$	$3\frac{1}{4}$
$\frac{27}{32}$	10	10		12	1.80	$9\frac{1}{2}$	$3\frac{1}{4}$
$\frac{7}{8}$	9	9	9	10, 12	2.10	10	$3\frac{31}{32}$
$\frac{29}{32}$	9	9		10, 12	2.10	10	$3\frac{31}{32}$
$\frac{15}{16}$	9	9	9	12	2.40	$10\frac{1}{2}$	$3\frac{31}{32}$
$\frac{31}{32}$	9	9		12	2.40	$10\frac{1}{2}$	$3\frac{31}{32}$
1	8	8	8	12	2.80	11	$4\frac{1}{16}$
$1\frac{1}{32}$	8	8		12	*	11	$4\frac{1}{16}$
$1\frac{1}{16}$	8	8				11	$4\frac{1}{16}$
$1\frac{1}{8}$	7	7	7	8		$11\frac{1}{2}$	$4\frac{23}{32}$
$1\frac{5}{32}$	7	7		8		$11\frac{1}{2}$	$4\frac{23}{32}$
$1\frac{3}{16}$	7	7				$11\frac{1}{2}$	$4\frac{23}{32}$
$1\frac{1}{4}$	7	7	7			12	$4\frac{23}{32}$
$1\frac{9}{32}$	7	7				12	$4\frac{23}{32}$
$1\frac{5}{16}$	7	7				12	$4\frac{23}{32}$
$1\frac{3}{8}$	6	6	6			$12\frac{1}{2}$	$5\frac{13}{32}$
$1\frac{11}{32}$	6	6				$12\frac{1}{2}$	$5\frac{13}{32}$
$1\frac{7}{16}$	6	6				$12\frac{1}{2}$	$5\frac{13}{32}$
$1\frac{1}{2}$	6	6	6			13	$5\frac{13}{32}$
$1\frac{17}{32}$	6	6				13	$5\frac{13}{32}$

†See page 31 for other threads, U. S. form, now furnished.

All left hand thread taps are special.

* new list. Write for quotations.

MACHINE OR NUT TAPS.

(CONCLUDED)

Diameter	Standard Number of Threads.			Price Each.	Total Length, Inches.	Length Thread, Inches.
	V	U. S. S.	Whit.			
1 5/8	5	5 1/2	5	$5.30	13 1/2	5 1/2
1 31/32	5	5 1/2		5.30	13 1/2	5 1/2
1 3/4	5	5	5	6.00	14	5 1/2
1 33/32	5	5		6.00	14	5 1/2
1 7/8	4 1/2	5	4 1/2	6.80	14 1/2	6 1/8
1 29/32	4 1/2	5		6.80	14 1/2	6 1/8
2	4 1/2	4 1/2	4 1/2	7.70	15	6 1/8
2 1/8	4 1/2	4 1/2	4 1/2	9.00	15 1/2	6 1/8
2 1/4	4 1/2	4 1/2	4	10.20	16	6 1/8
2 3/8	4 1/2	4	4	11.50	16 1/2	6 1/8
2 1/2	4	4	4	12.50	17	6 7/8
2 5/8	4	4	4	14.00	17 1/2	6 7/8
2 3/4	4	4	3 1/2	15.00	18	6 7/8
2 7/8	4	3 1/2	3 1/2	16.50	18 1/2	6 7/8
3	3 1/2	3 1/2	3 1/2	18.00	19	7 29/32
3 1/8	3 1/2	3 1/2	3 1/2	19.75	19 1/2	7 29/32
3 1/4	3 1/2	3 1/2	3 1/4	21.50	19 1/2	7 29/32
3 3/8	3 1/4	3 1/4	3 1/4	23.00	20	8 13/32
3 1/2	3 1/4	3 1/4	3 1/4	25.00	20	8 13/32
3 5/8	3 1/4	3 1/4	3 1/4	27.00	20 1/2	8 13/32
3 3/4	3	3	3	29.50	20 1/2	9 1/16
3 7/8	3	3	3	31.00	21	9 1/16
4	3	3	3	33.50	21	9 1/16

We also furnish taps from 2 to 4 inch inclusive, 1/32 oversize for rough iron, in V or U. S. S. forms of thread, at regular prices.

All left hand thread taps are special.

MACHINE SCREW TAPS.

Less than six taps of a size will be charged as single taps.

Taps will be furnished in sets of taper, plug and bottoming when desired, at regular prices.

All sizes and threads not listed will be considered special, and subject to special prices.

Left hand machine screw taps are special.

Screw Gauge No.	Prices.		St'd No.	Threads per Inch. Threads Also Furnished.	*A.S.M.E.Standard	
	Each.	Per Doz.			St'd Thd. per Inch.	Threads also Furnished.
0	$ .35	$4.00			80	
1	.35	4.00		56, 60, 64, 72	72	64
1½	.35	4.00		56		
2	.35	4.00	56	48, 64	64	56
3	.35	4.00	48	40, 56	56	48
4	.35	4.00	36	32, 40, 42, 48	48	36, 40
5	.35	4.00	36	32, 40	44	36, 40
6	.35	4.00	32	30, 36, 38, 40, 48	40	32, 36
7	.35	4.00	32	30, 40	36	30, 32
8	.35	4.00	32	30, 36, 40	36	30, 32
9	.35	4.00	30	28, 32	32	24, 30
10	.35	4.00	24	28, 30, 32, 36	30	24, 32
11	.35	4.00	24	28, 30		
12	.35	4.00	24	20, 32	28	24
13	.38	4.40	22	20, 24, 32		
14	.38	4.40	20	18, 24	24	20
15	.38	4.40	20	18, 24		
16	.38	4.40	18	16, 20	22	20
18	.38	4.40	18	16, 20	20	18
20	.45	5.30	16	18	20	18
22	.45	5.30	16	18	18	16
24	.45	5.30	16	14, 18	16	18
26	.53	6.30	16	14	16	14
28	.53	6.30	14	16	14	16
30	.53	6.30	14	16	14	16

*The above standard for machine screws has been approved by the American Society of Mechanical Engineers. See page No. 54 for detailed information on screws of this standard size.

PULLEY TAPS.

All orders will be filled with V standard thread unless otherwise specified. All sizes and threads not listed are special, and subject to special prices. Pulley taps with left hand threads are special.

Diam.	Number of Threads to Inch.			6 Inch.	8 Inch.	10 Inch.	12 Inch.	14 Inch.	16 Inch.	18 Inch.	20 Inch.	22 Inch.	24 Inch.
	†V	U.S.S	Whit.										
1/4	20	20	20	0.65	0.70	0.80	0.90						
5/16	18	18	18	.75	.80	1.00	1.20						
3/8	16	16	16	.80	.90	1.10	1.30	1.40	1.55	1.70			
7/16	14	14	14	.90	1.00	1.20	1.40	1.50	1.65	1.80			
1/2	*12	*13	12	1.00	1.15	1.30	1.45	1.60	1.75	1.90	2.05		
9/16	12	12	12	1.10	1.30	1.45	1.55	1.70	1.85	2.05	2.20	2.35	
5/8	11	11	11	1.20	1.35	1.50	1.60	1.75	1.90	2.10	2.25	2.40	2.55
11/16	11	11	11	1.30	1.45	1.55	1.70	1.90	2.05	2.20	2.35	2.50	2.65
3/4	10	10	10	1.40	1.50	1.60	1.80	2.00	2.15	2.30	2.45	2.60	2.75
13/16	10	10	10	1.60	1.70	1.80	2.00	2.15	2.30	2.45	2.60	2.75	2.90
7/8	9	9	9	1.80	1.90	2.10	2.30	2.50	2.70	2.90	3.10	3.30	3.50
15/16	9	9	9	2.00	2.10	2.30	2.50	2.70	2.90	3.10	3.30	3.50	3.70
1	8	8	8	2.25	2.30	2.50	2.70	2.90	3.10	3.30	3.50	3.70	3.90

*Also furnished with 12 threads U. S. S., or 13 threads V form, when desired.

†V thread pulley taps will soon be classed as special. Read pages 4, 5 and 6.

TAPPER TAPS.

Unless otherwise specified all orders will be filled with taps 11 inches long, having our standard V thread, and plain round shanks. V thread taps will shortly be classed as special. Read pages 4, 5 and 6.

Tapper taps with threads conforming to the standard adopted by the Association of Licensed Automobile Manufacturers will be furnished at regular prices. For list of sizes and threads, see page 30.

All sizes, lengths and threads not listed are special, and subject to special prices.

Tapper taps with left hand threads are special.

TAPPER TAPS.

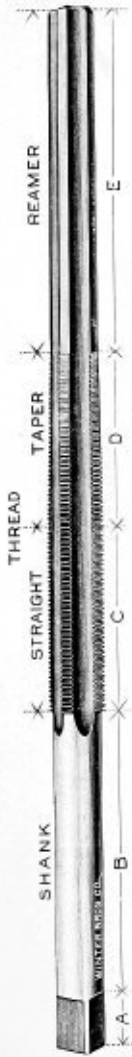
Diam	Number of Threads to Inch. V	U.S.S.	Whit.	Price Each. 11 Inch.	12 Inch.	14 Inch.	15 Inch.	Length of Thread, Inches.
1/4	20	20	20	$ .70	$ .75	$ .80	$ .90	1 3/4
17/64	20	20		.70	.75	.80	.90	1 3/4
9/32	20	20		.70	.75	.80	.90	1 3/4
5/16	18	18	18	.80	.85	.90	1.00	2
21/64	18	18		.80	.85	.90	1.00	2
11/32	18	18		.80	.85	.90	1.00	2
3/8	16	16	16	.90	.95	1.00	1.10	2
25/64	16	16		.90	.95	1.00	1.10	2
13/32	16	16		.90	.95	1.00	1.10	2
7/16	14	14	14	1.00	1.05	1.15	1.25	2 1/4
29/64	14	14		1.00	1.05	1.15	1.25	2 1/4
15/32	14	14		1.00	1.05	1.15	1.25	2 1/4
1/2	*12	*13	12	1.12	1.15	1.25	1.35	2 1/4
33/64	*12	*13		1.12	1.15	1.25	1.35	2 1/4
17/32	*12	*13		1.12	1.15	1.25	1.35	2 1/4
9/16	12	12	12	1.30	1.35	1.45	1.55	2 1/2
37/64	12	12		1.30	1.35	1.45	1.55	2 1/2
19/32	12	12		1.30	1.35	1.45	1.55	2 1/2
5/8	11	11	11	1.45	1.50	1.65	1.75	2 1/2
41/64	11	11		1.45	1.50	1.65	1.75	2 1/2
21/32	11	11		1.45	1.50	1.65	1.75	2 1/2
11/16	11	11	11	1.62	1.70	1.80	1.95	2 1/2
23/32	11	11		1.62	1.70	1.80	1.95	2 1/2
3/4	10	10	10	1.80	1.85	2.00	2.10	2 3/4
25/32	10	10		1.80	1.85	2.00	2.10	2 3/4

*Also furnished with 12 threads U. S. S., or 13 threads V form, when desired.

TAPPER TAPS.

(CONCLUDED.)

Diam.	Number of Threads to Inch.			Prices Each.				Length of Thd., Inches.
	V	U. S. S.	Whit.	11 Inch.	12 Inch.	14 Inch.	15 Inch.	
13/16	10	10	10	$2.05	$2.10	$2.25	$2.35	2 3/4
25/32	10	10		2.05	2.10	2.25	2.35	2 3/4
7/8	9	9	9	2.35	2.45	2.60	2.75	3
29/32	9	9		2.35	2.45	2.60	2.75	3
15/16	9	9	9	2.70	2.75	3.00	3.15	3
31/32	9	9		2.70	2.75	3.00	3.15	3
1	8	8	8	3.15	3.20	3.50	3.65	3 1/2
1 1/32	8	8		3.15	3.20	3.50	3.65	3 1/2
1 1/8	7	7	7	3.60	3.70	3.95	4.10	3 1/2
1 3/32	7	7		3.60	3.70	3.95	4.10	3 1/2
1 1/4	7	7	7	4.15	4.25	4.50	4.65	3 1/2
1 5/32	7	7		4.15	4.25	4.50	4.65	3 1/2
1 3/8	6	6	6	4.70	4.80	5.05	5.20	4
1 13/32	6	6		4.70	4.80	5.05	5.20	4
1 1/2	6	6	6	5.30	5.40	5.65	5.80	4
1 15/32	6	6		5.30	5.40	5.65	5.80	4
1 5/8	5	5 1/2	5	5.10	5.25	5.40	5.55	4 1/2
1 21/32	5	5 1/2		5.10	5.25	5.40	5.55	4 1/2
1 3/4	5	5	5	5.60	5.85	6.00	6.15	4 3/4
1 25/32	5	5		5.60	5.85	6.00	6.15	4 3/4
1 7/8	4 1/2	5	4 1/2	6.50	6.65	6.80	6.95	5
1 29/32	4 1/2	5		6.50	6.65	6.80	6.95	5
2	4 1/2	4 1/2	4 1/2	7.25	7.40	7.55	7.70	5
2 1/32	4 1/2	4 1/2		7.25	7.40	7.55	7.70	5



STAY-BOLT TAPS.

In ordering stay-bolt taps, state diameter and number of threads to the inch; also length, and dimensions of parts as indicated in the cut by letters A, B, C, D, E.

All stay-bolt taps will be furnished with 12 *V threads to the inch, unless otherwise specified.

Stay-bolt taps with 12 threads to the inch, Whitworth Standard form, furnished at regular list and discount.

The diameter given is that of the thread at its straight part.

Prices are for each inch of length, 16 inches and upwards.

Taps shorter than 16 inches will be charged as if 16 inches long.

Blank order slips will be furnished on application.

Diameter, Inches.	Price per Inch.
$\frac{3}{4}$ to $\frac{7}{8}$, inclusive	$ .40
$\frac{15}{16}$ to 1, inclusive	.45
$1\frac{1}{16}$ to $1\frac{1}{8}$, inclusive	.50
$1\frac{3}{16}$ to $1\frac{1}{4}$, inclusive	.55
$1\frac{5}{16}$ to $1\frac{3}{8}$, inclusive	.60
$1\frac{7}{16}$ to $1\frac{1}{2}$, inclusive	.70

*V thread taps will soon be classed as special, and the U. S. form used. Read pages 4, 5 and 6.

We make spindle stay bolt taps to order.

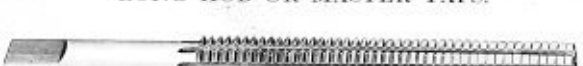
SHORT HOB TAPS.

All orders will be filled with †V standard threads unless otherwise specified.
Also furnished in rough iron sizes at regular prices.
All sizes and pitches not listed are special, and subject to special prices.
Short hob taps with left hand threads are special.

Diameter	Standard Number of Threads.			V Threads also Furnished.	Price Each.	Total Length, Inches.
	†V.	U. S. S.	Whit.			
1/4	20	20	20		$ .60	2 3/4
5/16	18	18	18		.70	3 1/8
3/8	16	16	16	14	.80	3 1/2
7/16	14	14	14	16	.90	3 3/4
1/2	12	*13	12	13, 14	1.00	4
9/16	12	12	12		1.15	4 1/4
5/8	11	11	11	10, 12	1.30	4 1/2
11/16	11	11	11	12	1.45	4 3/4
3/4	10	10	10		1.60	5
13/16	10	10	10		1.80	5 1/4
7/8	9	9	9		2.10	5 1/2
15/16	9	9	9		2.40	5 3/4
1	8	8	8		2.80	6
1 1/8	7	7	7	8	3.20	6 1/4
1 1/4	7	7	7		3.70	6 3/4
1 3/8	6	6	6		4.20	7
1 1/2	6	6	6		4.70	7 1/4
1 5/8	5	5 1/2	5		5.30	8
1 3/4	5	5	5		6.00	8 1/2
1 7/8	4 1/2	5	4 1/2		6.80	9
2	4 1/2	4 1/2	4 1/2		7.70	9 1/2

*Also furnished with 12 threads U. S. S., when desired.
†Read pages 4, 5 and 6.

LONG HOB OR MASTER TAPS.



All orders filled with †V standard thread unless otherwise specified.
We also furnish hob taps in rough iron sizes at regular prices.
All sizes and pitches not listed are special, and subject to special prices.
Long hob taps with left hand threads are special.

Diameter	Standard Number of Threads.			V Threads also Furnished.	Price Each.	Total Length Inches.
	†V	U. S. S.	Whit.			
1/4	20	20	20		$ .75	3 1/2
5/16	18	18	18		.87	4
3/8	16	16	16	14	1.00	4 1/2
7/16	14	14	14	16	1.12	5
1/2	12	*13	12	13, 14	1.25	5 1/2
9/16	12	12	12		1.44	6
5/8	11	11	11	10, 12	1.62	6 1/2
11/16	11	11	11	12	1.81	7
3/4	10	10	10		2.00	7 1/2
13/16	10	10	10		2.25	8
7/8	9	9	9		2.62	8 1/2
15/16	9	9	9		3.00	8 3/4
1	8	8	8		3.50	9
1 1/8	7	7	7	8	4.00	9 1/4
1 1/4	7	7	7		4.62	9 1/2
1 3/8	6	6	6		5.25	9 3/4
1 1/2	6	6	6		5.87	10
1 5/8	5	5 1/2	5		6.62	10 1/4
1 3/4	5	5	5		7.50	10 1/2
1 7/8	4 1/2	5	4 1/2		8.50	10 3/4
2	4 1/2	4 1/2	4 1/2		9.62	11

*Also furnished with 12 threads U. S. S., when desired.
†Read pages 4, 5, and 6.

STRAIGHT AND TAPER BOILER TAPS.

STRAIGHT

TAPER

These taps are slightly tapered to make a steam tight fit.
Also furnished $\frac{1}{32}$ oversize, when so desired.

Diameter.	Number of Threads.	Price Each.	Diameter.	Number of Threads.	Price Each.
$\frac{1}{2}$	12	$1.00	$1\frac{5}{16}$	12	$4.00
$\frac{9}{16}$	12	1.15	$1\frac{3}{8}$	12	4.30
$\frac{5}{8}$	12	1.30	$1\frac{7}{16}$	12	4.60
$\frac{11}{16}$	12	1.45	$1\frac{1}{2}$	12	4.90
$\frac{3}{4}$	12	1.60	$1\frac{5}{8}$	12	5.10
$\frac{13}{16}$	12	1.80	$1\frac{3}{4}$	12	5.40
$\frac{7}{8}$	12	2.10	$1\frac{7}{8}$	12	5.70
$\frac{15}{16}$	12	2.40	2	12	6.00
1	12	2.80	$2\frac{1}{8}$	12	6.50
$1\frac{1}{16}$	12	3.00	$2\frac{1}{4}$	12	7.00
$1\frac{1}{8}$	12	3.20	$2\frac{3}{8}$	12	7.50
$1\frac{3}{16}$	12	3.40	$2\frac{1}{2}$	12	8.00
$1\frac{1}{4}$	12	3.70			

PATCH BOLT TAPS.

These taps are slightly tapered to make a steam tight fit.
Also furnished $\frac{1}{32}$ oversize, when so desired.

Diameter.	Number of Threads.	Price Each.	Diameter.	Number of Threads.	Price Each.
$\frac{1}{2}$	12	$0.70	$\frac{15}{16}$	12	$1.80
$\frac{9}{16}$	12	.80	1	12	2.00
$\frac{5}{8}$	12	.90	$1\frac{1}{16}$	12	2.15
$\frac{11}{16}$	12	1.05	$1\frac{1}{8}$	12	2.25
$\frac{3}{4}$	12	1.20	$1\frac{3}{16}$	12	2.45
$\frac{13}{16}$	12	1.40	$1\frac{1}{4}$	12	2.60
$\frac{7}{8}$	12	1.60			

TAPS FOR BEAMAN & SMITH HOLDERS.

All orders filled with *V standard thread, unless otherwise specified.
A. L. A. M. Standard sizes furnished at regular prices. See page 30.
All sizes and threads not listed are special, and subject to special prices.
Left hand taps are special.

Diameter.	Fitting No. 1 Holder.		Diameter.	Fitting No. 2 Holder.	
	Number of Threads.	Price Each.		Number of Threads.	Price Each.
$\frac{1}{4}$	20	$0.45	$\frac{5}{8}$	11	$0.90
$\frac{5}{16}$	18	.50	$\frac{11}{16}$	11	1.05
$\frac{3}{8}$	16	.55	$\frac{3}{4}$	10	1.20
$\frac{7}{16}$	14	.60	$\frac{13}{16}$	10	1.40
$\frac{1}{2}$	12, 13	.70	$\frac{7}{8}$	9	1.60
$\frac{9}{16}$	12	.80	$\frac{15}{16}$	9	1.80
$\frac{5}{8}$	11	.90	1	8	2.00
			$1\frac{1}{8}$	7	2.25
			$1\frac{1}{4}$	7	2.60

*Read pages 4, 5, and 6.

STOVE BOLT TAPS.

We make our Stove Bolt Taps to correspond to the American Screw Co.'s Stove Bolts.

Less than six of a size will be charged as single taps.

All sizes and threads not listed are special, and subject to special prices.

Diameter	Standard Number of Threads	Price Each	Per Dozen
3/16	28	$0.35	$4.00
7/32	24	.35	4.00
1/4	22	.35	4.00
5/16	18	.38	4.40
3/8	18	.38	4.40
7/16	16	.45	5.30

HAND SCREW CHASERS.

These Chasers are furnished in V thread only.

All threads not listed are special, and subject to special prices.

		Each.	Per Pair.
Cutting	5, 6, 7, 8, 9, 10, 11, 11½, 12, 13, 14, 15 and 16 threads per inch,	$0.30	$0.60
Cutting	17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 56, 60, 62, 64 and 70 threads per inch,	.25	.50

PIPE TAPS AND REAMERS.

Pipe Hobs.

TAP

HOB

REAMER

Straight and taper pipe taps at regular prices.

When ordering specify whether right or left hand thread is wanted.

Diameter.	Price.	Diameter.	Price.	Diameter.	Price
⅛	$1.12	1	$3.12	2½	$10.50
¼	1.25	1¼	3.75	3	15.00
⅜	1.50	1½	4.62	3½	22.00
½	1.87	2	6.25	4	33.00
¾	2.50				

Pipe taps with inserted blades, in sizes up to 12 inch, made to order.

A. L. A. M. STANDARD

We furnish, at regular prices, taps and dies conforming to the standard adopted by the Association of Licensed Automobile Manufacturers.

Hand Taps at prices of corresponding sizes,as listed on pages 9 to 13 inclusive.

Nut Taps " " " " " as listed on pages 14 to 17 "

Tapper Taps at " " " " listed on pages 21 and 22.

Beaman & Smith Taps at prices of corresponding sizes, listed on page 27.

Round Dies at prices of corresponding sizes, listed on pages 33 to 46 inclusive

Spring Dies " " " " " listed on pages 51, 52 and 53.

The threads of A. L. A. M. Standard taps and dies are U. S. form.

SIZES AND THREADS.

Size, Inches.	Threads per Inch.	Size, Inches.	Threads per Inch.	Size, Inches.	Threads per Inch.
1/4	28	1/2	20	3/4	16
5/16	24	9/16	18	7/8	14
3/8	24	5/8	18	1	14
7/16	20	11/16	16		

NEW LIST OF TAPS WITH THREADS CONFORMING TO THE U. S. FORMULA.

All V thread taps and dies will shortly be eliminated from our regular lists, and classed and charged as special. To meet the demand for finer pitches than the regular United States Standard, and to take the place of the V thread taps which we intend to discard, we are now prepared to furnish, at regular prices, taps and dies with U. S. form threads in the pitches listed below in addition to the standard pitch for each size which has always been listed.

HAND TAPS AND MACHINE OR NUT TAPS.

Threads other than the standard pitch, U. S. Form, now furnished at regular prices.

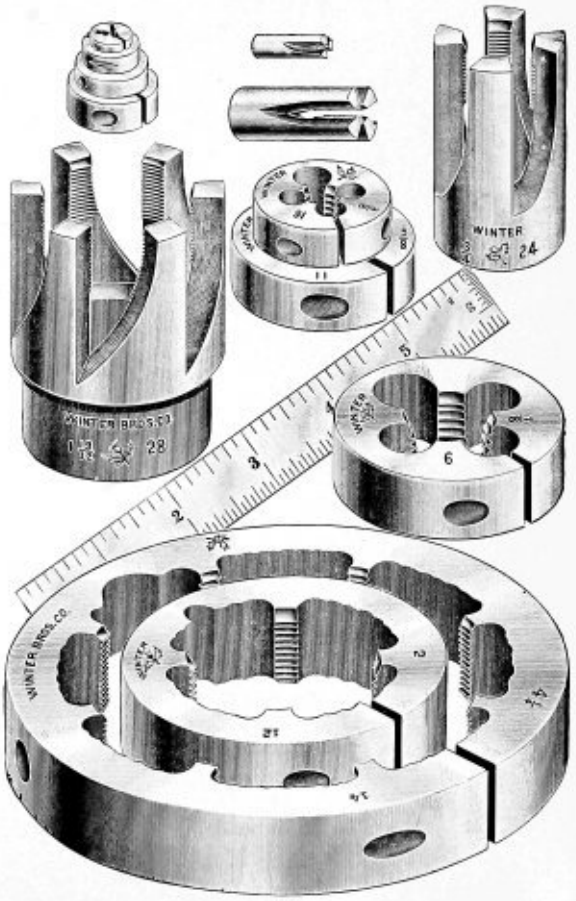
Size.	Threads.	Size.	Threads.
*1/8	27, 32, 36	11/16	12, 16,
3/16	24, 27, 32	3/4	12, 16, 27
1/4	24, 27, 28	13/16	12
5/16	20, 24, 27	7/8	12, 14, 27
3/8	20, 24, 27	15/16	12
7/16	20, 27	1	12, 14, 27
1/2	12, 20, 27	1 1/8	12
9/16	18, 27	1 1/4	12
5/8	12, 18, 27		

*Regular in hand taps only.

Larger sizes than the above have the standard thread only.

To the tapper tap and Beaman & Smith tap lists, which have been supplied in the standard pitch only, we have now added the A. L. A. M. standard pitches, which are U. S. form, (see page 30.)

All the above threads are also furnished in all round dies and spring screw threading dies.


WINTER
24
WINTER BROS. CO.
28
6
WINTER BROS. CO.

DIES.

We make many dies, both of the Round Adjustable and the Spring or Prong styles, for users of automatic screw machines, manufacturing the finest grades of threaded work. We have done much experimental work, and carefully studied the results obtained, that we might be in a position to furnish dies of the greatest efficiency, and we have been very successful in our efforts.

Our round dies are regularly made to cut from both sides, one side having considerably shorter taper than the other, to cut close up to a shoulder. If you wish both sides alike, either with short or long taper, the order must so specify.

Spring or prong dies are tapered two or three threads unless orders direct otherwise.

If dies are to be used exclusively on brass, we should be so informed. It is sometimes desirable to relieve the threads of dies for brass work, especially when cutting tapering threads, as in pipe fittings. We are prepared to furnish relieved dies at a small extra cost, when they are required.

Unless otherwise ordered all our round dies larger than $\frac{5}{8}$" outside diameter are split through one side, and adjustable by means of an easily operated screw; but we can furnish solid round dies, or split dies slotted for the points of three screws in die holders or collets.

We list many sizes of round dies in which the cutting size is larger than we would recommend, in proportion to the outside diameter, especially if dies are for machine use. If you wish the best results, keep within the limits plainly marked in the lists on the following pages.

In the case of special dies, when hobs or other tools must be made, their cost will be charged to the first order, and tools will remain in our possession.

Note that V threads will soon be discarded, and we are now prepared to furnish U. S. form threads in finer pitches than formerly. See list on page 31. Also read pages 4, 5 and 6.

ADJUSTABLE ROUND DIES.

No. 1.
5/8 INCH DIAM., 1/4 INCH THICK.
MACHINE SCREW SIZES.

All sizes and threads not listed are special, and subject to special prices.
Left hand dies are special.
Read page 33.

Size No.	Standard Thread.	Threads also Furnished.	*A.S.M.E. Standard.		Price Each.
			Std. Thds. per inch.	Threads also Furnished.	
1		56, 60, 64, 72	72	64	$ .40
1 1/2		56			.40
2	56	48, 64	64	56	.40
3	48	40, 56	56	48	.40
4	36	32, 40, 42, 48	48	36, 40	.40
5	36	32, 40	44	36, 40	.40
6	32	30, 36, 38, 40, 48	40	32, 36	.40
7	32	30, 40	36	30, 32	.40
8	32	30, 36, 40	36	30, 32	.40
†					
9	30	28, 32	32	24, 30	.40
10	24	28, 30, 32, 36	30	24, 32	.40
11	24	28, 30			.40
12	24	20, 32	28	24	.40
13	22	20, 24, 32			.40
14	20	18, 24	24	20	.40

*The above standard for machine screws has been approved by the American Society of Mechanical Engineers. See page 54 for detailed information of screws of this standard.

†For the best results, especially in automatic screw machine work, we strongly advise against using 5/8 inch diameter dies to cut sizes larger than No. 8.

NO. 1 ADJUSTABLE ROUND DIES.

(CONTINUED.)

⅝ INCH DIAM., ¼ INCH THICK.

Left hand dies are special.
†V thread dies will be sent unless otherwise ordered. Read page 33.

Cutting Size.	†V Standard.	U. S. S. Standard.	Whitworth Standard.	†V Threads also Furnished	Price Each.
1/16	72	64	60	60, 64	$ .40
3/64	72			56, 60, 64	.40
1/32	56	50	48	48, 50, 54, 60	.40
7/64	56			48	.40
1/8	40	40	40	32, 36, 48, 50	.40
9/64	40			32, 36	.40
5/32	32	36	32	30, 36, 40	.40
11/64	32			36	.40
††					
3/16	24	*32	*24	30, 32, 36	.40
13/64	24	*32		32	.40
7/32	24	28	24	32	.40
15/64	24			32	.40
1/4	20	20	20	24, 27, 32	.40
17/64	20	20		24, 27, 32	.40

*We also furnish 3/16 and 13/64 inch dies at regular list and discount with 24 threads U. S. S., and 1/4 dies with 32 threads Whitworth Standard form.

†V thread taps and dies will soon be omitted from our regular lists. Read pages 4, 5, and 6, and see new list of threads of U. S. form, page 31.

††For the best results, especially for automatic screw machine work, we strongly advise against the use of ⅝ inch diameter dies to cut sizes larger than 11/64 inch.

ADJUSTABLE ROUND DIES.

No. 2.
$\frac{13}{16}$ INCH DIAMETER, $\frac{1}{4}$ INCH THICK.
MACHINE SCREW SIZES.

All sizes and threads not listed are special, and subject to special prices.
Left hand dies are special.
Read page 33.

Size No.	Standard Number of Threads.	Threads also Furnished.	*A.S.M.E. Standard.		Price Each.
			Std. Thds. per Inch.	Threads also Furnished.	
1		56, 60, 64, 72	72	64	$ .40
1½		56			.40
2	56	48, 64	64	56	.40
3	48	40, 56	56	48	.40
4	36	32, 40, 42, 48	48	36, 40	.40
5	36	32, 40	44	36, 40	.40
6	32	30, 36, 38 40, 48	40	32, 36	.40
7	32	30, 40	36	30, 32	.40
8	32	30, 36, 40	36	30, 32	.40
9	30	28, 32	32	24, 30	.40
10	24	28, 30, 32, 36	30	24, 32	.40
11	24	28, 30			.40
12	24	20, 32	28	24	.40
†					
13	22	20, 24, 32			.40
14	20	18, 24	24	20	.40
15	20	18, 24			.40
16	18	16, 20	22	20	.40

*The above standard for machine screws has been approved by the American Society of Mechanical Engineers. See page 54 for detailed information on screws of this standard.

†For the best results, especially in automatic screw machine work, we strongly advise against using $\frac{13}{16}$ inch diameter dies to cut sizes larger than No. 12.

NO. 2 ADJUSTABLE ROUND DIES.

(CONTINUED)

$\frac{13}{16}$ INCH DIAM., $\frac{1}{4}$ INCH THICK.

Left hand dies are special.

Read page 33.

†V thread dies will be sent unless otherwise ordered.

Cutting Sizes.	Standard Number of threads.			†V Threads also Furnished.	Price Each.
	†V	U. S. S.	Whit.		
$\frac{1}{16}$	72	64	60	60, 64	$0.40
$\frac{5}{64}$	72			56, 60, 64	.40
$\frac{3}{32}$	56	50	48	48, 50, 54, 60	.40
$\frac{7}{64}$	56			48	.40
$\frac{1}{8}$	40	40	40	32, 36, 48, 50	.40
$\frac{9}{64}$	40			32, 36	.40
$\frac{5}{32}$	32	36	32	30, 36, 40	.40
$\frac{11}{64}$	32			36	.40
$\frac{3}{16}$	24	*32	*24	30, 32, 36	.40
$\frac{13}{64}$	24	*32		32	.40
$\frac{7}{32}$	24	28	24	32	.40
$\frac{15}{64}$	24			32	.40
†					
$\frac{1}{4}$	20	20	20	24, 27, 32	.40
$\frac{17}{64}$	20	20		24, 27, 32	.40
$\frac{9}{32}$	20	20		24, 27, 32	.40
$\frac{5}{16}$	18	18	18	20, 24, 27, 32	.40

*We also furnish $\frac{3}{16}$ and $\frac{13}{64}$ inch dies with 24 thread U. S. S. form, and $\frac{3}{16}$ dies with 32 thread Whitworth form, at regular prices.

†V thread taps and dies will soon be eliminated from our regular lists. Read pages 4, 5 and 6; also see new list of threads of U. S. form on page 31.

†For best results, especially in automatic screw machine work, we strongly recommend that $\frac{13}{16}$ inch diameter dies should not be used to cut sizes larger than $\frac{13}{64}$ inch.

No. 3 ADJUSTABLE ROUND DIES.

1 Inch Diam., $\frac{3}{8}$ Inch Thick.

All sizes and threads not listed are special and subject to special prices.
Left hand dies are special.
Read page 33.

MACHINE SCREW SIZES.

Size No.	Standard Thread	Threads also Furnished	A.S.M.E. Standard *Thread	Standard Threads also Furnished	Price Each
4	36	32, 40, 42, 48	48	36, 40	$0.75
5	36	32, 40	44	36, 40	.75
6	32	30, 36, 38, 40, 48	40	32, 36	.75
7	32	30, 40	36	30, 32	.75
8	32	30, 36, 40	36	30, 32	.75
9	30	28, 32	32	24, 30	.75
10	24	28, 30, 32, 36	30	24, 32	.75
11	24	28, 30			.75
12	24	20, 32	28	24	.75
13	22	20, 24, 32			.75
14	20	18, 24	24	20	.75
15	20	18, 24			.75
16	18	16, 20	22	20	.75
†					
18	18	16, 20	20	18	.75
20	16	18	20	18	.75
22	16	18	18	16	.75
24	16	14, 18	16	18	.75

*The above standard for machine screws has been approved by the American Society of Mechanical Engineers. See page 54 for detailed information on screws of this standard.

†For best results, especially in automatic screw machine work, we strongly advise against using dies 1 inch diameter to cut sizes larger than No. 16.

NO. 3 ADJUSTABLE ROUND DIES.

(CONCLUDED.)

1 INCH DIAM., $\frac{3}{8}$ INCH THICK.

Left hand dies are special.

Read page 33.

†V thread dies will be sent unless otherwise ordered.

Size.	Standard Number of Threads.			†V Threads also Furnished	Price Each.
	†V	U.S.S.	Whit.		
$\frac{1}{8}$	40	40	40	32, 36, 48, 50	$0.75
$\frac{9}{64}$	40			32, 36	.75
$\frac{5}{32}$	32	36	32	30, 36, 40	.75
$\frac{11}{64}$	32			36	.75
$\frac{3}{16}$	24	*32	*24	30, 32, 36	.75
$\frac{13}{64}$	24	*32		32	.75
$\frac{7}{32}$	24	28	24	32	.75
$\frac{15}{64}$	24			32	.75
$\frac{1}{4}$	20	20	20	24, 27, 32	.75
$\frac{17}{64}$	20	20		24, 27, 32	.75
$\frac{9}{32}$	20	20		24, 27, 32	.75
§					
$\frac{5}{16}$	18	18	18	20, 24, 27, 32	.75
$\frac{21}{64}$	18	18		20, 24, 27, 32	.75
$\frac{11}{32}$	18	18		20, 24, 27, 32	.75
$\frac{3}{8}$	16	16	16	14, 18, 20, 24, 27	.75
$\frac{25}{64}$	16	16		14, 18, 20, 24, 27	.75
$\frac{13}{32}$	16	16		14, 18, 20, 24, 27	.75
$\frac{7}{16}$	14	14	14	12, 16, 20, 24, 27	.75

*We also furnish $\frac{3}{16}$ and $\frac{13}{64}$ inch dies with 24 threads to the inch, U. S. form: and $\frac{3}{16}$ inch dies with 32 threads, Whitworth form, at regular prices.

†V thread taps and dies will soon be omitted from our regular lists. Read pages 4, 5 and 6: also see new list of threads of U. S. form, pages 30 and 31.

§For the best results, especially on automatic screw machine work, we strongly advise against using 1 inch diameter dies to cut sizes larger than $\frac{7}{32}$ inch.

NO. 3½ ADJUSTABLE ROUND DIES.

1⅝ Inch Diam., 7/16 Inch Thick.

All sizes and threads not listed are special.
Left hand dies are special.
Read page 33.

Machine Screw Sizes.

Size No.	Standard Thread.	Threads also Furnished.	*A. S. M. E. Standard.		Price Each.
			Standard Thread.	Threads also Furnished.	
10	24	28, 30, 32, 36	30	24, 32	$1.00
11	24	28, 30			1.00
12	24	20, 32	28	24	1.00
13	22	20, 24, 32			1.00
14	20	18, 24	24	20	1.00
15	20	18, 24			1.00
16	18	16, 20	22	20	1.00
18	18	16, 20	20	18	1.00
20	16	18	20	18	1.00
22	16	18	18	16	1.00
24	16	14, 18	16	18	1.00
26	16	14	16	14	1.00
†					
28	14	16	14	16	1.00
30	14	16	14	16	1.00

*See page 54 for detailed information in regard to this standard, which has been approved by the American Society of Mechanical Engineers.

†For the best results, especially for automatic screw machine work, we strongly advise against using 1⅝ inch diameter dies to cut sizes larger than No. 26.

NO. 3½ ADJUSTABLE ROUND DIES.

(CONCLUDED.)

1 5/16 INCH DIAM., 7/16 INCH THICK.

All sizes and threads not listed are special, and subject to special prices. Left hand dies are special.

Read page 33.

§All orders will be filled with V thread dies, unless otherwise specified.

Cutting Size.	Standard Number of Threads.			§V Threads also Furnished.	Price Each.
	§V	U.S.S.	Whit.		
1/16	24	*32	*24	30, 32, 36	$1.00
13/64	24	*32		32	1.00
7/32	24	28	24	32	1.00
15/64	24			32	1.00
1/4	20	20	20	24, 27, 32	1.00
17/64	20	20		24, 27, 32	1.00
9/32	20	20		24, 27, 32	1.00
5/16	18	18	18	20, 24, 27, 32	1.00
21/64	18	18		20, 24, 27, 32	1.00
11/32	18	18		20, 24, 27, 32	1.00
3/8	16	16	16	14, 18, 20, 24, 27	1.00
25/64	16	16		14, 18, 20, 24, 27	1.00
13/32	16	16		14, 18, 20, 24, 27	1.00
††					1.00
7/16	14	14	14	12, 16, 20, 24, 27	1.00
29/64	14	14		12, 16, 20, 24, 27	1.00
15/32	14	14		12, 16, 20, 24, 27	1.00
1/2	12	†13	12	13, 14, 16, 20, 24, 27	1.00
33/64	12	†13		13, 14, 16, 20, 24, 27	1.00
17/32	12	†13		13, 14, 16, 20, 24, 27	1.00

*We also furnish 3/16 and 13/64 inch dies with 24 threads to the inch, U. S. S., and 5/16 inch dies with 32 threads to the inch, Whitworth form, at regular price.

†Dies cutting 1/2 inch are furnished with 12 threads to the inch, U. S. S. form, at regular prices.

§V thread taps and dies will soon be omitted from our regular lists. Read pages 4, 5 and 6; also see new list of threads of U. S. form, pages 30 and 31.

††For the best results, especially for automatic screw machine work, we strongly advise against the use of 1 5/16 inch diameter dies to cut sizes larger than 13/32 inch.

ADJUSTABLE ROUND DIES.

No. 4.
1½ Inch Diam., ½ Inch Thick.

No. 5.
2 Inch Diam., ⅝ Inch Thick

*All orders filled with V standard thread unless otherwise specified.
All sizes and threads not listed are special, and subject to special prices.
Left hand dies are special.
Read page 33.

Size	Standard Number of Threads.			*V Threads also Furnished.	Price Each.	
	*V	U. S. S.	Whit.		No. 4.	No. 5.
¼	20	20	20	24, 27, 32	$1.00	$1.25
17/64	20	20		24, 27, 32	1.00	1.25
9/32	20	20		24, 27, 32	1.00	1.25
5/16	18	18	18	20, 24, 27, 32	1.00	1.25
21/64	18	18		20, 24, 27, 32	1.00	1.25
11/32	18	18		20, 24, 27, 32	1.00	1.25
3/8	16	16	16	14, 18, 20, 24, 27	1.00	1.25
25/64	16	16		14, 18, 20, 24, 27	1.00	1.25
13/32	16	16		14, 18, 20, 24, 27	1.00	1.25
7/16	14	14	14	12, 16, 20, 24, 27,	1.00	1.25

*V thread taps and dies will soon be omitted from all of our regular lists. Read pages 4, 5 and 6; also see page 31 for new list of threads of U. S. form, which are now supplied at regular prices, and A. L. A. M. standard sizes on page 30.

ADJUSTABLE ROUND DIES.

(CONCLUDED.)

No. 4. 1 1/2 Inch Diam., 1/2 Inch Thick. — No. 5. 2 Inch Diam., 5/8 Inch Thick

Diameter	Standard Number of Thread.			†V Threads also Furnished.	Price Each.	
	†V	U. S. S.	Whit.		No. 4.	No. 5.
3/64	14	14		12, 16, 20, 24, 27	$1.00	$1.25
1/32	14	14		12, 16, 20, 24, 27	1.00	1.25
1/16	12	*13	12	13, 14, 16, 20, 24, 27	1.00	1.25
3/64	12	*13		13, 14, 16, 20, 24, 27	1.00	1.25
1/32	12	*13		13, 14, 16, 20, 24, 27	1.00	1.25
††						
5/64	12	12	12	14, 27	1.15	1.50
3/32	12	12		14, 27	1.15	1.50
1/32	12	12		14, 27	1.15	1.50
5/64	11	11	11	10, 12, 20, 24, 27	1.25	1.50
3/32	11	11		10, 12, 20, 24, 27	1.25	1.50
1/32	11	11		10, 12, 20, 24, 27	1.25	1.50
††						
1/16	11	11	11	10, 12		1.75
3/32	11	11		10, 12		1.75
1/4	10	10	10	12, 20, 27		1.75
3/32	10	10		12, 20, 27		1.75

*Also furnished with 12 threads U. S. S. form, when desired.

†V thread dies sent unless otherwise ordered, but note that V thread taps and dies will soon be classed as specials. Read pages 4, 5, and 6; also see page 31 for new list of threads of U. S. form now furnished at regular prices, and A. L. A. M. standard sizes, page 30.

††For best results, especially for automatic screw machine work, we strongly advise against the use of 1 1/2 inch diameter dies to cut sizes larger than 1/2 inch; and 2 inch diameter dies to cut larger than 3/4 inch, excepting in the finer pitches.

ADJUSTABLE ROUND DIES.

No. 6. 2½ Inch Diam., ¾ Inch Thick.

No. 7. 3 Inch Diam. 1 Inch Thick.

†All orders will be filled with V standard thread, unless otherwise specified.
All sizes and threads not listed are special, and subject to special prices.
Left hand dies are special.
Read page 33.

Size.	Standard No. of Threads.			†V Threads also Furnished.	Price Each.	
	†V	U.S.S.	Whit.		No. 6.	No. 7.
¼	20	20	20	24, 27, 32	$1.50	
5/32	20	20		24, 27, 32	1.50	
3/16	18	18	18	20, 24, 27, 32	1.50	
11/32	18	18		20, 24, 27, 32	1.50	
3/8	16	16	16	14, 18, 20, 24, 27	1.50	
13/32	16	16		14, 18, 20, 24, 27	1.50	
7/16	14	14	14	12, 16, 20, 24, 27	1.50	
15/32	14	14		12, 16, 20, 24, 27	1.50	
½	12	*13	12	13, 14, 16, 20, 24, 27	1.50	$2.50
17/32	12	*13		13, 14, 16, 20, 24, 27	1.50	2.50
9/16	12	12	12	14, 27	1.75	2.75
19/32	12	12		14, 27	1.75	2.75

*Also furnished with 12 threads, U. S. form, when so ordered.

†V thread taps and dies will soon be classed as special; see pages 4, 5 and 6. Also see page 31 for new list of threads of U. S. form now furnished at regular prices; and A. L. A. M. standard size on page 30.

ADJUSTABLE ROUND DIES.

No. 6. $2\frac{1}{2}$ Inch Diam., $\frac{3}{4}$ Inch Thick.

No. 7. 3 Inch Diam., 1 Inch Thick.

(CONCLUDED.)

Size.	Standard Number of Threads.			†V Threads also Furnished.	Price Each.	
	V	U. S. S.	Whit.		No. 6.	No. 7.
$\frac{5}{8}$	11	11	11	10, 12, 20, 24, 27	$1.75	$2.75
$\frac{23}{32}$	11	11		10, 12, 20, 24, 27	1.75	2.75
$\frac{11}{16}$	11	11	11	10, 12	2.00	3.00
$\frac{23}{32}$	11	11		10, 12	2.00	3.00
$\frac{3}{4}$	10	10	10	12, 20, 27	2.00	3.00
$\frac{25}{32}$	10	10		12, 20, 27	2.00	3.00
$\frac{13}{16}$	10	10	10	12	2.25	3.25
$\frac{27}{32}$	10	10		12	2.25	3.25
$\frac{7}{8}$	9	9	9	10, 12, 27	2.25	3.25
$\frac{29}{32}$	9	9		10, 12, 27	2.25	3.25
$\frac{15}{16}$	9	9	9	12	2.50	3.50
$\frac{31}{32}$	9	9		12	2.50	3.50
1	8	8	8	12, 27	2.50	3.50
††						
$1\frac{1}{32}$	8	8		12, 27	2.50	3.50
$1\frac{1}{16}$	8	8		12	2.75	3.75
$1\frac{1}{8}$	7	7	7	8, 12	2.75	3.75
$1\frac{5}{32}$	7	7		8, 12	2.75	3.75
$1\frac{3}{16}$	7	7			3.00	4.00
$1\frac{1}{4}$	7	7	7	12	3.00	4.00
††						
$1\frac{9}{32}$	7	7		12	3.00	4.00
$1\frac{5}{16}$	7	7				4.25
$1\frac{3}{8}$	6	6	6			4.25
$1\frac{13}{32}$	6	6				4.25
$1\frac{7}{16}$	6	6				4.50
$1\frac{1}{2}$	6	6	6			4.50
$1\frac{15}{32}$	6	6				4.50

†See note on page 44.

††We advise against using No. 6 dies for larger than 1 inch, and No. 7 dies for larger than $1\frac{1}{4}$ inch, excepting for fine pitches.

ADJUSTABLE ROUND DIES.

*All orders will be filled with V standard thread unless otherwise specified.
Threads furnished as per Hand Tap list, pages 9 to 13.
All sizes and threads not listed are special, and subject to special prices.
Left hand dies are special.

Size	DIAMETERS.					
	1 5/16"	1 11/32"	1 7/16"	1 3/4"	2 3/16"	2 1/4"
1/4	$1.00	$1.00	$1.25	$1.50	$1.50	$1.50
5/16	1.00	1.00	1.25	1.50	1.50	1.50
3/8	1.00	1.00	1.25	1.50	1.50	1.50
7/16	1.00	1.00	1.25	1.50	1.50	1.50
†1/2	1.00	1.00	1.25	1.50	1.50	1.50
9/16			1.25	1.75	1.75	1.75
5/8			1.25	1.75	1.75	1.75
11/16				2.00	2.00	2.00
3/4				2.00	2.00	2.00
13/16					2.25	2.25
7/8					2.25	2.25
15/16					2.50	2.50
1					2.50	2.50

*V thread taps and dies will soon be classed as specials; read pages 4, 5 and 6.
†For the best results we advise against the use of sizes larger than those above the horizontal lines, excepting for fine pitches.

SOLID DIE STOCKS.

For Round Solid and Round Adjustable Dies.

Number.	No. of Dies.	Outside Diameter of Dies.	Length of Stock.	Price Each.
1	1	$\frac{5}{8}$	5	$0.45
2	2	$\frac{13}{16}$	7	.45
3	3	1	10	1.00
$3\frac{1}{2}$	$3\frac{1}{2}$	$1\frac{5}{16}$	12	1.25
4	4	$1\frac{1}{2}$	14	1.50
5	5	2	22	1.75
6	6	$2\frac{1}{2}$	30	2.00

No. 4 and larger have steel tubing handles.

ADJUSTABLE ROUND DIES FOR PIPE.

Right or Left Hand.

Size.	Diameter of Dies.					
	1	$1\frac{5}{16}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
$\frac{1}{8}$	$0.75	$1.00	$1.00	$1.25	$1.50	$2.50
$\frac{1}{4}$		1.00	1.00	1.25	1.50	2.50
$\frac{3}{8}$			1.25	1.50	1.75	2.75
$\frac{1}{2}$				1.75	2.25	3.25
$\frac{3}{4}$					2.50	3.50
1						4.00

Read page 33.
Solid round dies for pipe at same prices.

SOLID SQUARE BOLT DIES.

†All orders filled with V standard thread, unless otherwise specified.

We also furnish dies $\frac{1}{32}$ and $\frac{1}{64}$" oversize for rough iron. These take the list of the standard size, and our regular discount.

All sizes and threads not listed are special, and subject to special prices.

Left hand dies are special.

Size.	Standard Number of Threads.			†V Threads also Furnished.	Size of Square	Thickness	Price Each
	†V	U.S.S.	Whit.				
$\frac{1}{4}$	20	20	20		$2\frac{1}{2}$	$\frac{1}{2}$	$1.80
$\frac{5}{16}$	18	18	18	16	$2\frac{1}{2}$	$\frac{1}{2}$	1.80
$\frac{3}{8}$	16	16	16	14	$2\frac{1}{2}$	$\frac{1}{2}$	1.80
$\frac{7}{16}$	14	14	14	12	$2\frac{1}{2}$	$\frac{1}{2}$	1.80
$\frac{1}{2}$	12	*13	12	13	$2\frac{1}{2}$	$\frac{3}{4}$	1.80
$\frac{9}{16}$	12	12	12		$2\frac{1}{2}$	$\frac{3}{4}$	1.90
$\frac{5}{8}$	11	11	11	10, 12	$2\frac{1}{2}$	$\frac{3}{4}$	2.00

*Also furnished with 12 threads U. S. S. when desired.

†V thread taps and dies will soon be omitted from our lists. Read pages 4, 5 and 6.

SOLID SQUARE BOLT DIES.

(CONCLUDED)

Size.	Standard Number of Threads.			V Threads also Furnished.	Size of Square.	Thickness.	Price Each.
	V	U.S.S.	Whit.				
11/16	11	11	11	12	2 1/2	3/4	$2.10
3/4	10	10	10	12	2 1/2	3/4	2.20
13/16	10	10	10	12	2 1/2	3/4	2.30
7/8	9	9	9	10, 12	2 1/2	3/4	2.40
15/16	9	9	9	12	2 1/2	3/4	2.55
1	8	8	8	12	2 1/2	1	2.70
1 1/16	8	8		12	2 1/2	1	2.85
1 1/8	7	7	7	12	2 1/2	1	3.00
1 3/16	7	7		12	2 1/2	1	3.15
1 1/4	7	7	7	12	2 1/2	1	3.30
1 5/16	7	7			2 1/2	1	3.45
1 3/8	6	6	6		2 1/2	1	3.60
1 7/16	6	6			2 1/2	1	3.75
1 1/2	6	6	6		3	1	3.90
1 5/8	5	5 1/2	5		3	1	4.20
1 3/4	5	5	5		3	1 1/4	5.40
1 7/8	4 1/2	5	4 1/2		3 1/2	1 1/2	6.50
2	4 1/2	4 1/2	4 1/2		3 3/4	2	7.50

SOLID SQUARE PIPE DIES.

Dies furnished with either right or left hand thread.

Size.	Dimensions of Dies.	Price
1/8 to 1/2	2 x 2 x 1/2	$1.50
1/4 to 1	2 1/2 x 2 1/2 x 3/4	2.00
3/4 to 1 1/2	3 x 3 x 3/4	2.50
1 1/4 to 2	4 x 4 x 7/8	3.50
2 1/2 to 3	5 x 5 x 1 1/4	9.00

SPRING SCREW THREADING DIES AND CLAMP COLLARS.

We recommend these dies for screw machine work. They are easily adjusted by means of clamp collar, and can be readily sharpened. The impression prevails that a roughing and a finishing die are necessary to produce good work; but it will be found that our spring dies will cut threads in one operation as nearly perfect as can be produced by any kind of die, only coarse pitches requiring roughing dies.

Clamp collars are not furnished with dies unless ordered.

Left hand dies are special.

Read information on page 33.

MACHINE SCREW SIZES.

Size of Screw Gauge.	Standard No. of Threads Per Inch.	A. S. M. E. Standard Threads.	Diameter of Die Inches.	Length of Die, Inches.	Price Each.	Price of Clamp Collar.
2	56	64	1/2	1 1/4	$1.50	$0.50
3	48	56	1/2	1 1/4	1.50	.50
4	36	48	1/2	1 1/4	1.50	.50
5	36	44	1/2	1 1/4	1.50	.50
6	32	40	1/2	1 1/4	1.50	.50
8	32	36	1/2	1 1/4	1.50	.50
10	24	30	1/2	1 1/4	1.50	.50
8	32	36	3/4	1 3/4	1.75	.60
10	24	30	3/4	1 3/4	1.75	.60
12	24	28	3/4	1 3/4	1.75	.60
14	20	24	3/4	1 3/4	1.75	.60

Other threads furnished as in machine screw tap list, on page 18.

SPRING SCREW THREADING DIES AND CLAMP COLLARS.

(CONTINUED.)

All sizes and threads not listed are special.
Dies with left hand threads are special.

Diam. Inches.	Length Inches.	Cutting Size.	Standard No. of Threads.			V Threads also Furnished.	Price Each.	Clamp Collars. Price Each.
			††V	U.S.S.	Whit.			
1/2	1 1/4	1/8	40	40	40	32,36	$1.50	$ .50
1/2	1 1/4	3/16	24	*32	*24	30,32,36	1.50	.50
1/2	1 1/4	1/4	20	20	20	24,27,32	1.50	.50
3/4	1 3/4	1/4	20	20	20	24,27,32	1.75	.60
3/4	1 3/4	5/16	18	18	18	20,24,27,32	1.75	.60
3/4	1 3/4	3/8	16	16	16	18,20,24,27	1.75	.60
1	2	3/8	16	16	16	18,20,24,27	2.00	.70
1	2	7/16	14	14	14	16,20,24,27	2.00	.70
1	2	1/2	12	†13	12	13,14,16,20,24,27	2.00	.70
1 1/16	2 1/4	7/16	12	12	12	14,27	2.00	.80
1 1/16	2 1/4	5/8	11	11	11	12,20,24,27	2.00	.80
1 1/16	2 1/4	11/16	11	11	11	12	2.00	.80
1 1/16	2 1/4	3/4	10	10	10	12,20,27	2.00	.80
1 1/4	2 1/2	3/8	16	16	16	18,20,24,27	2.00	.80
1 1/4	2 1/2	7/16	14	14	14	16,20,24,27	2.00	.80
1 1/4	2 1/2	1/2	12	†13	12	13,14,16,20,24,27	2.00	.80
1 1/4	2 1/2	7/16	12	12	12	14,27	2.00	.80
1 1/4	2 1/2	5/8	11	11	11	12,20,24,27	2.00	.80
1 1/4	2 1/2	3/4	10	10	10	12,20,27	2.00	.80
1 3/8	2 1/2	1/2	12	†13	12	13,14,16,20,24,27	2.40	1.00
1 3/8	2 1/2	9/16	12	12	12	14,27	2.40	1.00

*We also furnish, at regular prices, 3/16" Spring Dies with 24 threads per inch, U. S. form; and 32 threads per inch, Whitworth form.

†Also regularly furnished with 12 threads per inch, U. S. form.

††V threads taps and dies will soon be eliminated from our lists. In this connection read pages 4, 5 and 6; also see page 31 for new list of threads, U. S. form, now regularly furnished; and page 30 for A. L. A. M. Standard threads.

SPRING SCREW THREADING DIES AND CLAMP COLLARS.

(CONCLUDED.)

All sizes and threads not listed are special.
Dies with left hand threads are special.

Diam. Inches.	Length Inches.	Cutting Size.	Standard No. of Threads.			*V Threads also Furnished	Price Each.	Clamp Collars Price Each.
			*V	U.S.S.	Whit.			
1 3/8	2 1/2	5/8	11	11	11	12, 20, 24, 27	$2.40	$1.00
1 3/8	2 1/2	3/4	10	10	10	12, 20, 27	2.40	1.00
1 5/8	2 1/2	5/8	11	11	11	12, 20, 24, 27	2.75	1.20
1 5/8	2 1/2	3/4	10	10	10	12, 20, 27	2.75	1.20
1 5/8	2 1/2	13/16	10	10	10	12	2.75	1.20
1 5/8	2 1/2	7/8	9	9	9	10, 12, 27	2.75	1.20
1 5/8	2 1/2	1	8	8	8	12, 27	2.75	1.20
2	3	3/4	10	10	10	12, 20, 27	3.50	1.50
2	3	7/8	9	9	9	10, 12, 27	3.50	1.50
2	3	15/16	9	9	9	12	3.50	1.50
2	3	1	8	8	8	12, 27	3.50	1.50
2	3	1 1/8	7	7	7	8, 12	3.50	1.50
2	3	1 1/4	7	7	7	12	3.50	1.50
2 1/2	3 1/2	1	8	8	8	12, 27	5.00	2.50
2 1/2	3 1/2	1 1/8	7	7	7	8, 12	5.00	2.50
2 1/2	3 1/2	1 1/4	7	7	7	12	5.00	2.50
2 1/2	3 1/2	1 3/8	6	6	6		5.00	2.50
2 1/2	3 1/2	1 1/2	6	6	6		5.00	2.50
3 1/4	4	1 5/8	5	5 1/2	5		8.00	5.00
3 1/4	4	1 3/4	5	5	5		8.00	5.00
3 1/4	4	1 7/8	4 1/2	5	4 1/2		8.00	5.00
3 1/4	4	2	4 1/2	4 1/2	4 1/2		8.00	5.00

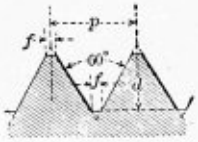
*V thread taps and dies will soon be eliminated from our lists. Read pages 4, 5 and 6; also see page 31 for new list of threads, U. S. form, now regularly furnished; and A. L. A. M. Standard threads on page 30.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS' STANDARD.

A. S. M. E. STANDARD.

FOR MACHINE SCREWS.

United States Standard Form of Thread.



See formula, page 6.

STANDARD SCREWS.

NOTE—Maximum sizes given are the standard sizes.

Basic Size		Outside Diameter.		Pitch Diameter.		Root Diameter.	
No.	O.D.-T.P.I.	Min.	Max.	Min.	Max.	Min.	Max.
0	.060–80	.0572	.0600	.0505	.0519	.0410	.0438
1	.073–72	.0700	.0730	.0625	.0640	.0520	.0550
2	.086–64	.0828	.0860	.0742	.0759	.0624	.0657
3	.099–56	.0955	.0990	.0857	.0874	.0721	.0758
4	.112–48	.1082	.1120	.0966	.0985	.0808	.0849
5	.125–44	.1210	.1250	.1082	.1102	.0910	.0955
6	.138–40	.1338	.1380	.1197	.1218	.1007	.1055
7	.151–36	.1466	.1510	.1308	.1330	.1097	.1149
8	.164–36	.1596	.1640	.1438	.1460	.1227	.1279
9	.177–32	.1723	.1770	.1544	.1567	.1307	.1364
10	.190–30	.1852	.1900	.1660	.1684	.1407	.1467
12	.216–28	.2111	.2160	.1903	.1928	.1633	.1696
14	.242–24	.2368	.2420	.2123	.2149	.1807	.1879
16	.268–22	.2626	.2680	.2358	.2385	.2013	.2090
18	.294–20	.2884	.2940	.2587	.2615	.2208	.2290
20	.320–20	.3144	.3200	.2847	.2875	.2468	.2550
22	.346–18	.3402	.3460	.3070	.3099	.2649	.2738
24	.372–16	.3660	.3720	.3284	.3314	.2810	.2908
26	.398–16	.3920	.3980	.3544	.3574	.3070	.3168
28	.424–14	.4178	.4240	.3745	.3776	.3204	.3312
30	.450–14	.4438	.4500	.4005	.4036	.3464	.3572

A. S. M. E. STANDARD.

(CONCLUDED.)

SPECIAL SCREWS.

NOTE:—Maximum sizes given are the standard sizes.

Basic Size		Outside Diameter		Pitch Diameter		Root Diameter	
No.	O.D.-T.P.I.	Min.	Max.	Min.	Max.	Min.	Max.
1	.073-64	.0698	.0730	.0612	.0629	.0494	.0527
2	.086-56	.0825	.0860	.0727	.0744	.0591	.0628
3	.099-48	.0952	.0990	.0836	.0855	.0678	.0719
4	.112-40	.1078	.1120	.0937	.0958	.0747	.0795
	.112-36	.1076	.1120	.0918	.0940	.0707	.0759
5	.125-40	.1208	.1250	.1067	.1088	.0877	.0925
	.125-36	.1206	.1250	.1048	.1070	.0837	.0889
6	.138-36	.1336	.1380	.1178	.1200	.0967	.1019
	.138-32	.1333	.1380	.1154	.1177	.0917	.0974
7	.151-32	.1463	.1510	.1284	.1307	.1047	.1104
	.151-30	.1462	.1510	.1269	.1294	.1017	.1077
8	.164-32	.1593	.1640	.1414	.1437	.1177	.1234
	.164-30	.1592	.1640	.1399	.1423	.1147	.1207
9	.177-30	.1722	.1770	.1529	.1553	.1277	.1337
	.177-24	.1718	.1770	.1473	.1499	.1158	.1229
10	.190-32	.1853	.1900	.1674	.1697	.1437	.1494
	.190-24	.1848	.1900	.1603	.1629	.1287	.1359
12	.216-24	.2108	.2160	.1863	.1889	.1547	.1619
14	.242-20	.2364	.2420	.2067	.2095	.1688	.1770
16	.268-20	.2624	.2680	.2327	.2355	.1948	.2030
18	.294-18	.2882	.2940	.2550	.2579	.2129	.2218
20	.320-18	.3142	.3200	.2810	.2839	.2389	.2478
22	.346-16	.3400	.3460	.3024	.3054	.2550	.2648
24	.372-18	.3662	.3720	.3330	.3359	.2909	.2998
26	.398-14	.3918	.3980	.3485	.3516	.2944	.3052
28	.424-16	.4180	.4240	.3804	.3834	.3330	.3428
30	.450-16	.4440	.4500	.4064	.4094	.3590	.3688

The above standard for Machine Screws was adopted by the American Society of Mechanical Engineers at the Indianapolis meeting, May 28-31, 1907.

For full and complete details concerning this standard and the Engineers' recommendations, see their report, Volume 28, No. 9.

We are prepared to furnish Machine Screw Taps and Round Adjustable Dies to correspond to this standard when so ordered, at regular prices. For list see tap list on page 18, and round die lists on pages 34, 36, 38, 40; also spring die list on page 51.

STANDARD DIMENSIONS OF WROUGHT-IRON WELDED TUBES.

Briggs' Standard.

Diameter of Tubes			Thickness of Metal Inches.	Screwed Ends	
Nominal Inside Inches.	Actual Inside Inches.	Actual Outside Inches.		Number of Threads to Inch.	Length of Perfect Thread Inches.
$\frac{1}{8}$	0.270	0.405	0.068	27	0.19
$\frac{1}{4}$	0.364	0.540	0.088	18	0.29
$\frac{3}{8}$	0.494	0.675	0.091	18	0.30
$\frac{1}{2}$	0.623	0.840	0.109	14	0.39
$\frac{3}{4}$	0.824	1.050	0.113	14	0.40
1	1.048	1.315	0.134	$11\frac{1}{2}$	0.51
$1\frac{1}{4}$	1.380	1.660	0.140	$11\frac{1}{2}$	0.54
$1\frac{1}{2}$	1.610	1.900	0.145	$11\frac{1}{2}$	0.55
2	2.067	2.375	0.154	$11\frac{1}{2}$	0.58
$2\frac{1}{2}$	2.468	2.875	0.204	8	0.89
3	3.067	3.500	0.217	8	0.95
$3\frac{1}{2}$	3.548	4.000	0.226	8	1.00
4	4.026	4.500	0.237	8	1.05
$4\frac{1}{2}$	4.508	5.000	0.246	8	1.10
5	5.045	5.563	0.259	8	1.16
6	6.065	6.625	0.280	8	1.26
7	7.023	7.625	0.301	8	1.36
8	7.982	8.625	0.322	8	1.46
*9	9.000	9.688	0.344	8	1.57
10	10.019	10.750	0.366	8	1.68

Taper of conical tube-ends, 1 in 32 to axis of tube ($\frac{3}{4}$ inch per foot.)

The sizes of twist drills to be used in boring holes to be reamed with pipe reamer, and threaded with pipe tap, are as follows:

Size, Tap	Diameter Drill	Size Tap	Diameter Drill
$\frac{1}{8}$ inch	$\frac{11}{32}$ inch	$1\frac{1}{4}$ inches	$1\frac{7}{64}$ inches
$\frac{1}{4}$ inch	$\frac{7}{16}$ inch	$1\frac{1}{2}$ inches	$1\frac{23}{64}$ inches
$\frac{3}{8}$ inch	$\frac{9}{16}$ inch	2 inches	$2\frac{7}{16}$ inches
$\frac{1}{2}$ inch	$\frac{45}{64}$ inch	$2\frac{1}{2}$ inches	$2\frac{57}{64}$ inches
$\frac{3}{4}$ inch	$\frac{57}{64}$ inch	3 inches	$3\frac{13}{44}$ inches
1 inch	$1\frac{1}{8}$ inches		

*By the action of the manufacturers of wrought-iron pipe and boiler tubes, at a meeting, held in New York, May 9, 1889, a change in size of actual outside diameter of 9-inch pipes was adopted, making the latter 9.625 instead of 9.688 inches, as given in the table of Briggs' Standard pipe diameters.

DIFFERENT STANDARDS FOR WIRE GAUGE IN USE IN THE UNITED STATES.

Dimensions of Sizes in Decimal Parts of an Inch.

No. of Wire Gauge	American or Brown & Sharpe	Birmingham or Stubs' Wire	Washburn & Moen Mfg. Co. Worcester, Mass.	Trenton Iron Co. Trenton, N. J.	Stubs' Steel Wire	U. S. Standard for Plate	No. of Wire Gauge
000000	.....	....	.....	.....	.....	.46875	000000
00000	.....	....	.....	.45	.....	.4375	00000
0000	.46	.454	.3938	.4	.....	.40625	0000
000	.40964	.425	.3625	.36	.....	.375	000
00	.3648	.38	.3310	.33	.....	.34375	00
0	.32486	.34	.3065	.305	.....	.3125	0
1	.2893	.3	.2830	.285	.227	.28125	1
2	.25763	.284	.2625	.265	.219	.265625	2
3	.22942	.259	.2437	.245	.212	.25	3
4	.20431	.238	.2253	.225	.207	.234375	4
5	.18194	.22	.2070	.205	.204	.21875	5
6	.16202	.203	.1920	.19	.201	.203125	6
7	.14428	.18	.1770	.175	.199	.1875	7
8	.12849	.165	.1620	.16	.197	.171875	8
9	.11443	.148	.1483	.145	.194	.15625	9
10	.10189	.134	.1350	.13	.191	.140625	10
11	.090742	.12	.1205	.1175	.188	.125	11
12	.080808	.109	.1055	.105	.185	.109375	12
13	.071961	.095	.0915	.0925	.182	.09375	13
14	.064084	.083	.0800	.08	.180	.078125	14
15	.057068	.072	.0720	.07	.178	.0703125	15
16	.05082	.065	.0625	.061	.175	.0625	16
17	.045257	.058	.0540	.0525	.172	.05625	17
18	.040303	.049	.0475	.045	.168	.05	18
19	.03589	.042	.0410	.04	.164	.04375	19
20	.031961	.035	.0348	.035	.161	.0375	20
21	.028462	.032	.03175	.031	.157	.034375	21
22	.025347	.028	.0286	.028	.155	.03125	22
23	.022571	.025	.0258	.025	.153	.028125	23
24	.0201	.022	.0230	.0225	.151	.025	24
25	.0179	.02	.0204	.02	.148	.021875	25
26	.01594	.018	.0181	.018	.146	.01875	26
27	.014195	.016	.0173	.017	.143	.0171875	27
28	.012641	.014	.0162	.016	.139	.015625	28
29	.011257	.013	.0150	.015	.134	.0140625	29
30	.010025	.012	.0140	.014	.127	.0125	30
31	.008928	.01	.0132	.013	.120	.0109375	31
32	.00795	.009	.0128	.012	.115	.01015625	32
33	.00708	.008	.0118	.011	.112	.009375	33
34	.006304	.007	.0104	.01	.110	.00859375	34
35	.005614	.005	.0095	.0095	.108	.0078125	35
36	.005	.004	.0090	.009	.106	.00703125	36
37	.004453	....	.....	.0085	.103	.006640625	37
38	.003965	....	.....	.008	.101	.00625	38
39	.003531	....	.....	.0075	.099	.....	39
40	.003144	.....	.....	.007	.097	.....	40

TAP DRILLS.

For V Thread Hand and Nut Taps.

Size of Tap.	Size of Drill.	Size of Tap.	Size of Drill.	Size of Tap.	Size of Drill.
1/4–18	12	1/2–14	13/32	1 1/8–9	31/64
1/4–20	9	9/16–12	29/64	1–8	7/8
1/4–24	5	5/8–10	1/2	1 1/8–7	15/16
5/16–18	1/4	5/8–11	33/64	1 1/4–7	1 1/16
5/16–20	F	5/8–12	33/64	1 3/8–6	1 9/64
3/8–14	L	11/16–11	37/64	1 1/2–6	1 17/64
3/8–16	N	3/4–10	5/8	1 5/8–5	1 11/32
3/8–18	5/16	3/4–12	41/64	1 3/4–5	1 15/32
7/16–14	S	13/16–10	11/16	1 7/8–4 1/2	1 3/4
1/2–12	X	7/8–9	47/64	2 –4 1/2	1 13/16
1/2–13	Y				

For U. S. S. Thread Hand and Nut Taps.

Size of Tap.	Size of Drill.	Size of Tap.	Size of Drill.	Size of Tap	Size of Drill.
1/4–20	9	3/4–10	41/64	1 3/4–5	1 13/64
5/16–18	1/4	7/8–9	3/4	1 7/8–5	1 41/64
3/8–16	5/16	1–8	55/64	2 –4 1/2	1 47/64
7/16–14	23/64	1 1/8–7	31/32	2 1/4–4 1/2	1 49/64
1/2–13	27/64	1 1/4–7	1 5/32	2 1/2–4	2 13/64
9/16–12	15/32	1 3/8–6	1 11/64	2 3/4–4	2 23/64
5/8–11	17/32	1 1/2–6	1 17/64	3 –3 1/2	2 31/32
11/16–11	19/32	1 5/8–5 1/2	1 13/32		

These sizes do not leave a full thread when holes are tapped, but are as near it as is desirable for practical manufacturing.

TAP DRILLS FOR MACHINE SCREW TAPS.

Size of Tap.	Size of Drill.	Size of Tap.	Size of Drill.
1–56	53	11–28	18
1–60	53	11–30	17
1–64	53	12–20	19
1–72	52	12–24	17
1½–56	52	12–32	12
2–48	50	13–20	16
2–56	49	13–22	13
2–64	48	13–24	11
3–40	47	14–18	13
3–48	45	14–20	10
3–56	44	14–24	7
4–32	44	15–18	8
4–36	43	15–20	6
4–40	43	15–24	7/32
4–48	42	16–16	6
5–32	40	16–18	4
5–36	38	16–20	3
5–40	37	18–16	1
6–30	36	18–18	B
6–32	34	18–20	C
6–36	33	20–16	¼
6–40	31	20–18	G
7–30	31	22–16	J
7–32	⅛	22–18	L
8–30	29	24–14	M
8–32	29	24–16	N
8–36	27	24–18	O
9–30	27	26–14	P
9–32	25	26–16	Q
10–24	25	28–14	S
10–30	21	28–16	T
10–32	20	30–14	V
11–24	20	30–16	W

These drill sizes are larger than are published in many similar lists, but will be found none too large in practice.

TAP DRILLS.

For A. S. M. E. Standard Machine Screw Taps.

The sizes given will cut considerably larger than the root of the thread, and are larger than published in some similar lists, but for practical operation especially for machine tapping, will be found none too large.

Size of Tap.	No. of Threads.	Size of Drill.	Size of Tap.	No. of Threads.	Size of Drill.
0	80	55	10	24	25
1	64	53	10	30	22
1	72	52	10	32	21
2	56	49	12	24	17
2	64	48	12	28	15
3	48	45	14	20	10
3	56	44	14	24	7
4	36	43	16	20	3
4	40	43	16	22	$\frac{7}{32}$
4	48	42	18	18	B
5	36	39	18	20	C
5	40	38	20	18	G
5	44	37	20	20	H
6	32	34	22	16	K
6	36	33	22	18	L
6	40	32	24	16	N
7	30	31	24	18	O
7	32	$\frac{1}{8}$	26	14	$\frac{21}{64}$
7	36	30	26	16	Q
8	30	29	28	14	S
8	32	29	28	16	$\frac{23}{64}$
8	36	28	30	14	V
9	24	29	30	16	W
9	30	27			
9	32	26			

MACHINE AND WOOD SCREW GAUGE.

Number of Screw Gauge.	Size of Number in Decimals.	Number of Screw Gauge.	Size of Number in Decimals.
000	.03152	25	.38684
00	.04468	26	.40000
0	.05784	27	.41316
1	.07100	28	.42632
2	.08416	29	.43948
3	.09732	30	.45264
4	.11048	31	.46580
5	.12364	32	.47896
6	.13680	33	.49212
7	.14996	34	.50528
8	.16312	35	.51844
9	.17628	36	.53160
10	.18944	37	.54476
11	.20260	38	.55792
12	.21576	39	.57108
13	.22892	40	.58424
14	.24208	41	.59740
15	.25524	42	.61056
16	.26840	43	.62372
17	.28156	44	.63688
18	.29472	45	.65004
19	.30788	46	.66320
20	.32104	47	.67636
21	.33420	48	.68952
22	.34736	49	.70268
23	.36052	50	.71584
24	.37368		

The difference between consecutive sizes is .01316 inch.

TWIST DRILL AND STEEL WIRE GAUGE SIZES.

No.	Size	No.	Size.
1	.2280	31	.1200
2	.2210	32	.1160
3	.2130	33	.1130
4	.2090	34	.1110
5	.2055	35	.1100
6	.2040	36	.1065
7	.2010	37	.1040
8	.1990	38	.1015
9	.1960	39	.0995
10	.1935	40	.0980
11	.1910	41	.0960
12	.1890	42	.0935
13	.1850	43	.0890
14	.1820	44	.0860
15	.1800	45	.0820
16	.1770	46	.0810
17	.1730	47	.0785
18	.1695	48	.0760
19	.1660	49	.0730
20	.1610	50	.0700
21	.1590	51	.0670
22	.1570	52	.0635
23	.1540	53	.0595
24	.1520	54	.0550
25	.1495	55	.0520
26	.1470	56	.0465
27	.1440	57	.0430
28	.1405	58	.0420
29	.1360	59	.0410
30	.1285	60	.0400

LETTER SIZES.

A .234	H .266	O .316	U .368
B .238	I .272	P .323	V .377
C .242	J .277	Q .331	W .386
D .246	K .281	R .339	X .397
E .25	L .29	S .348	Y .404
F .257	M .295	T .358	Z .413
G .261	N .302		

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